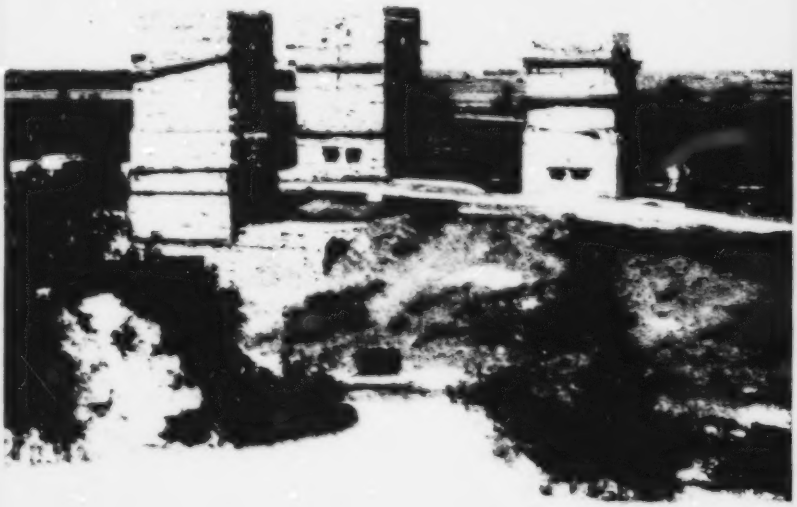
The Stonewall Quarries



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Manitoba
Culture, Heritage
and Recreation

R-01409/1

Manitoba Culture, Heritage and Recreation
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CANADIAN CATALOGUING IN PUBLICATION DATA

Main entry under title:

The Stonewall quarries.

ISBN 0-7711-0101-5.

1. Limestone industry — Manitoba — Stonewall — History. 2. Lime industry — Manitoba — Stonewall — History. 3. Stonewall (Man.) — Manufactures — History. I. Manitoba. Historic Resources Branch.

HD9621.C33S76 1985 338.2'7516'0971274
C85-097316-3

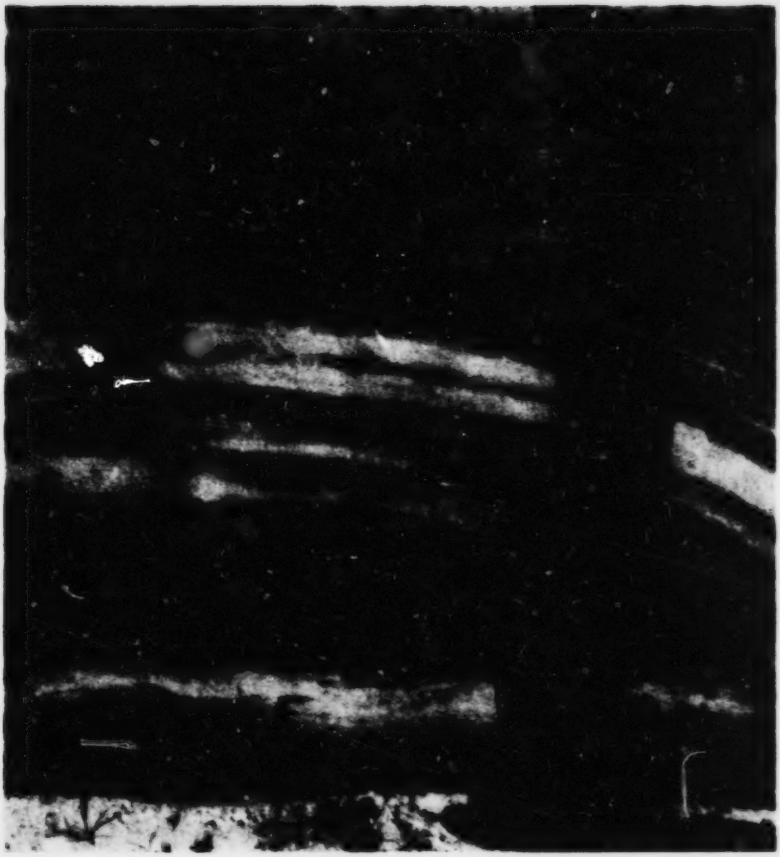
The Stonewall Quarries

Motorists travelling northeast of town near the Manitoba Interlake community of Stonewall often notice several large limestone towers which resemble the ruined fortifications of some ancient empire. In fact, these imposing structures — about 15 metres tall on average — are part of a recently-developed historical site and recreation facility where much can be learned about one of Manitoba's oldest natural resources. The towers are huge abandoned kilns once used for firing local limestone to produce lime, a chemical compound which has been employed in various mortars, plasters, cements, fertilizers, disinfectants and in the manufacture of newsprint. The kilns, and the worked-over stone pits associated with them, allude to the quarrying activity which was a vital mainstay of the Stonewall district economy.

The now defunct quarries at Stonewall are among numerous others that have flourished in Manitoba southwest of the Precambrian Shield, which cuts across the province from its southeastern corner toward the Flin Flon district in the west. These quarries exploited abundant limestone formations of varying quality, usefulness, and ease of recovery. The most famous quarries, perhaps, are those in the Garson-Tyndall district, source of the 'Tyndall stone' which lends distinctive elegance and majesty to many buildings throughout Canada. Indeed, many people associate Manitoba limestone almost exclusively with the fine masonry which graces such edifices as the province's Legislative Building. However, limestone entered Manitoba's natural history — and found a foothold in the history of human settlement in the province — on much humbler terms than this association tends to suggest.

Fossils and the Fur-Trade Era

Limestone's very appearance attests to its humble origins in the sedimentary ooze of long-vanished bodies of salt water that once covered vast areas of the North American continent. Many have been fascinated by the fossilized remains of ancient organisms locked within limestone. Millions of years ago, the stone began to form when such organic matter, deposited as marine sediments, was subjected to compression by the weight of subsequent deposits, and by the restless shifting of the earth's crust. Within the compacting sediments, fine fossil debris gradually recrystallized and became changed into solid limestone (lithified), much as soft snow can be compacted to solid crystalline ice. When limestone sediments are deeply buried and subject to high temperature and pressure, the crystalline rock which is formed is a marble. Where compaction and recrystallization are least extensive, the resulting rock is of the soft variety known as chalk. Most of the limestones of Manitoba are rocks intermediate between these two extremes. No true marbles are known in Manitoba, but some formations contain rock so extensively lithified that it will take a high polish. The latter rock has been called "marble" by some quarry operators. Limestones at Stonewall are moderately well-lithified. The fossils they contain indicate that the original sediments were deposited from a sea that covered all or most of Manitoba about 450,000 years ago.



Courtesy Manitoba Energy & Mines

Manitoba limestone — an ancient natural resource in which fossilized remains of organisms commonly can be discerned.

Geologists define "limestone" as a sedimentary rock that contains at least 50 per cent calcium carbonate. Its usefulness and commercial classification are governed by the proportion of another chemical compound — magnesium carbonate — which in combination with calcium carbonate forms the mineral, **dolomite.** In turn, where dolomite content exceeds 50 per cent, the rock is more properly designated as a dolomite rock or "dolostone". However, common usage in the mineral industry applies the term "limestone" alike to the true limestones and to dolomites. Both types of limestone can be burned in kilns, but result in respectively different products when processed in this manner. The calcining (kilning) of true limestone produces high-calcium lime, a valuable product which can

be used in the manufacture of Portland cement if the lime is sufficiently pure. Limestones quarried at Steeprock and Mafeking in Manitoba are used for this purpose. On the other hand, dolomite yields a high-magnesium lime that has much more limited use, principally as a type of plaster. The rocks of the Stonewall area are all dolomites, and the kiln products were high-magnesium lime.

Historians have discovered general references in fur-trade documents as to the early use of lime for firming up plaster and for chink-caulking in log-built trading posts and habitations. Fur-trade personnel — and the settlers who began to join them at the Red River Settlement after 1811 — knew all too well the piercing bitterness of winter winds and the hazards posed by exposure of precious provisions to the elements. At least some of these pioneers resorted to burning local limestone in order to procure construction materials that would make their homes and other buildings weather-worthy. Apparently, some obtained lime simply by stacking limestone on burning brush-piles. Others built rudimentary kilns which were little more than holes in the ground into which were fed fuel and stone.

It is unknown precisely how extensive was the use of limestone and limestone-derived construction materials during the early decades of fur-trading and Hudson's Bay Company (HBC) administration of settlement in the Red River Valley. However, the writings of 19th-century local historian Alexander Ross offer some information pertinent to the question. Writing in 1856, Ross recalled that lime had first been manufactured at the HBC's struggling settlement more than 30 years earlier during the 1822-23 governorship of Captain Andrew Bulger. Ross reported that a number of quarries had been launched at the (northernmost) "lower end" of the settlement, but it seems likely that these either provided stone for localized individual projects, or were a source of the raw material required for lime manufacture. This was a far cry from a later era's quarrying of stone for long-range rail shipment to construction sites. And only during the mid-1800s, added Ross, were "the more solid structures of lime (mortar, likely made of sand mixed with lime) and stone...in some few instances beginning to be intr uced by the Company..." Only "very lately" was lime coming into noteworthy use in "building and the whitewashing of houses." Here, as in so many other developments at Red River, the HBC led the way.

The year 1830 witnessed plans for a grand — and enduring — HBC venture in the structural use of quarried limestone. This resulted in the launching of the Lower Fort Garry construction project in which powerful and controversial HBC Governor George Simpson loomed large. The HBC had utilized Manitoba limestone as early as 1731 in erecting Fort Prince of Wales near present-day Churchill. However, until Lower Fort Garry began to take shape at the hands of HBC labourers and stonemasons, the sub-Arctic post remained a unique departure from the Company's use of local lumber in constructing its facilities. Even so important an HBC post as Upper Fort Garry (at the junction of the Red and Assiniboine rivers) was fashioned of wood. And that, in Simpson's view, was precisely the problem, given the annual threat of severe flooding.

Courtesy Manitoba Archives

HBC Governor George Simpson influenced the advent of stone and lime construction at Red River.

Simpson's letter of 18 July 1831 to HBC senior officials in London eloquently recalls the circumstances — and perhaps the governor's pretentions — which provided a locally-unprecedented stimulus to the quarrying of structural-quality limestone in Manitoba. Simpson wrote that the wood-constructed Upper Fort was:

> ...in a very dilapidated state, so much so as to be scarcely habitable, and lies so low that we are every successive spring apprehensive that it will be carried away by high water at the breaking up of the ice. It is moreover very disadvantageously situated...I therefore determined last fall on abandoning that establishment altogether, and instead of wasting time, labour and money in temporary repairs of tottering wooden buildings, to set about erecting a good solid comfortable Establishment of Stone and Lime in such a situation as to be entirely out of reach of high water...about 20 miles below the present Establisht...and hope to see New Fort Garry (the only stone and lime — and may I add the most respectable looking — Establishment in Indian country) occupied next spring.

The new 'establishment' only for an exceedingly brief period lived up to Simpson's hopes that it would replace the Upper Fort as the HBC's headquarters at Red River. But although the "Stone Fort" below present-day Lockport ultimately proved to be only of secondary significance in fur-trade annals, its construction directly resulted in an important addition to the pool of artisanal skills available to those who would begin to quarry and use limestone as something other than a source of chalky, sticky white powder. Perhaps the most notable among stone-working artisans who arrived at Red River to join the ongoing Stone Fort construction project during the 1830s and 1840s was the redoubtable Duncan McRae. Accompanied by a fellow Hebridean stone mason, John Clouston, McRae emigrated from Scotland in 1838, and spent ten years working on walls and bastions at both the Lower and Upper forts. During the next six decades, McRae plied his skills as a stonemason in erecting several churches and private dwellings which have stood for more than a century, and are much-valued examples of early Red River architecture.

McRae's working life as a Manitoba stonemason spanned two distinct eras in Manitoba history — he lived to witness the supercession of HBC administration by the government of Canada, as well as the advent of Manitoba limestone quarrying and lime-manufacturing on an industrial scale.

Courtesy Manitoba Archives

Duncan McRae, pioneer stonemason.

Manitoba's Limestone Industry: the Stonewall Quarries in Context

The settlement of the prairie West began in earnest with the introduction of railway transportation during the early 1880s. Population growth and railway expansion gave rise to an unprecedented demand for quarried local stone and other construction materials in the burgeoning urban centres of western Canada. The emergence of a thriving Manitoba limestone industry during 1880-1914 was a direct reflection of this development boom. Railway companies themselves utilized broken local stone as track-bed ballast, but more important, they made viable the commercial exploitation of once-remote natural limestone formations in Manitoba's Interlake region. Quarries were opened along newly-built railway lines. In turn, new communities — among them Stonewall — grew up around the quarries. The early history of Stonewall suggests the extent to which the fortunes of these communities were linked with those of the limestone industry, and with circumstances prevailing within urban construction markets.

Courtesy Manitoba Archives

S.J. Jackson, Stonewall MLA and businessman, acquired land at the townsite in 1875 and guided the early development of the community.

In 1881, Stonewall was connected with Winnipeg by a Manitoba government-built colonization railway line. This encouraged A.H. Clarke and John Gunn to open the town's first quarry pits near the southeast corner of town. They soon were joined by other entrepreneurs: in 1882, two brothers, Enoch and Joseph Williams established a rival quarry to the northwest. By 1905, the Stonewall limestone formation supported five quarry operations whose facilities formed a near-continuous arch-shaped pit at the northern and eastern limits of town. In 1904, a single quarry at Stonewall employed 150 men who produced cut building stone, 100,000 bushels (nearly 30 million litres) of lime, and 10,000 cords (nearly 36 thousand cubic metres) of rubble.

Courtesy the Stonewall Argus

Loading Stonewall lime kilns with firewood (prior to 1900).

Quarry operations involved considerable division of labour, and required a large general work force. Individual operations included stripping overburden from the face of the limestone formation, drilling, blasting, stone-breaking, crushing and hauling. The initial clearing away of trees, brush, topsoil and clay was so arduous as to require the use of horse-drawn implements. Dynamite could be used in procuring limestone which was to be reduced to rubble and lime, but not, at first, if the stone was to be used in slabs or other large pieces for construction purposes. Large blocks with straight edges were separated from limestone beds by skilled craftsmen applying spikes and wedges — "plugs and feathers" — to the rock face, although eventually a new process involving small, painstakingly-positioned charges of dynamite came into use.

Courtesy the Stonewall Argus

Limestone quarrying activity was well established at Stonewall prior to 1900, and was stimulated further by Manitoba's unprecedented development boom at the turn of the century.

The work was hard and sometimes dangerous. Serious accidents, some fatal, occurred at Stonewall and nearby Stony Mountain in 1926, 1930, and 1932. The production of lime demanded the best efforts of pioneer stone-breakers who wielded sharp-faced hammers weighing 18 pounds to break rock into fragments which were then sorted according to size. Mechanical crushers made this work somewhat less formidable in terms of the muscle power required, but only at the expense of an increased strain on workers' nerves. The crushing machines were particularly unpopular because of the hazards they posed to life and limb.

For many turn-of-the-century quarrymen, who earned an average daily wage of two dollars, limestone work represented the first jobs they found after immigrating to Manitoba from central Canada and foreign countries. Those not directly involved in procuring and processing stone were involved in building and maintaining kilns, transporting fuel and supplies, and in many cases, providing support services to the quarries as blacksmiths, stablemen, and coopers. The concentration of quarry and quarry-support workers and their families was substantial enough to provide an enduring early basis for the emergence of the Town of Stonewall in the midst of the Municipality of Rockwood. Similar development occurred around other rail-side quarries in Manitoba prior to the First World War.

Meanwhile, technological changes — ranging from the engineering of buildings to the processing of limestone — influenced the appearance, organization, and priorities of the province's limestone industry. Quarry activities underwent contraction and over-all consolidation between 1900 and 1930. At Stonewall, for example, only one quarry operator remained in business in 1927, whereas there had been eight to ten operators there during the 1890s. The surviving firm — Winnipeg Supply and Fuel Company — had purchased the Patters, Fullbrook, and Irwin pioneering quarry operations in 1910, while the Williams and Gunn interests had amalgamated as Manitoba Quarries Limited six years later before dropping out of sight as distinct operations during the ensuing decade.

These developments have been linked to the introduction of Portland Cement after 1889, and various changes in the building industry which culminated in the proliferation of the steel-frame building. Cement began to displace quarried stone in the construction industry because it was cheaper and easier to use in building basements, foundations, curbs, and other engineering works. Meanwhile, steel-frame construction eliminated the general use of massive stone blocks as a time-honoured means of structural support. If stone was used at all in steel-frame buildings, it usually functioned merely ornamentally, and required only the finest-quality stone cut into thin slabs. This stood in good stead the Garson-Tyndall quarry operators, who had at their disposal top-grade building-stone formations. However, other Manitoba quarry operators — including those at Stonewall — found themselves at a disadvantage, for they had access to limestone formations less suited to ornamental masonry work. Stonewall quarries produced stone used in rough-face work on Winnipeg's downtown Eaton's store — built in 1905 — and the Land Titles Building. Closer to home, local stone was used in building several impressive structures in Stonewall itself, including the Post Office (now the South Interlake

Regional Library). But the ever-fewer quarry operators at Stonewall concentrated their efforts on the manufacture of lime, rather than on producing stone for structural use.

This emphasis upon lime manufacture involved successive refinements in the stone-firing kilns used at the Stonewall quarries, and the local landscape to this day is marked by evidence of these technological innovations. The remains of one of Enoch Williams' rudimentary, firebrick-lined pot kilns can be visited in Stonewall Quarry Park. The disadvantage in using this type of kiln was the length of time required for the kiln to cool before newly-manufactured lime could be recovered from the firing chamber. The so-called "periodic kiln" was supplanted after 1895 by the tall "draw-kiln" design imported from the United States. Draw kilns could operate continuously, because as new lime was produced in them, it was cooled by the updraft of the furnaces and could be removed — "drawn" — into wheelbarrows every two or three hours. Each of these kilns could produce about 15 tons (about 13.6 metric tonnes) of quicklime daily. The five, towering draw kilns still standing at Stonewall provide the best-concentrated view of this kind of technology anywhere in southern Manitoba.

Closely allied with kiln technology was the succession of different derricks used to lift and load for firing tons of limestone. In Manitoba Interlake quarries, two types of derricks were prevalent. The "Guy" derrick — involving a central mast 'guyed' by steel cables — could lift limestone blocks weighing as much as 25 tons (about 22.6 metric tonnes) as it rotated on a circular platform. The "Stiff Leg" derrick was most common in shallow quarries where it was necessary to move the derrick from place to place within the pit. Instead of guy wires, wooden beams supported its central mast. Derricks were used to haul hoppers of limestone above the top-loading kilns. Gunn's quarry at Stonewall featured a trestle and hopper cars to ease this operation. Of course, derricks also were used for general-purpose lifting of heavy loads of stone.

Courtesy the *Stonewall Argus*

Wintry, but eloquent testimony to Stonewall's history as a Manitoba quarrying community: the remains of early "pot" kilns.

Limestone quarrying continued at Stonewall until 1967, when depletion of the rock formation, and economic considerations, impelled Winnipeg Supply and Fuel Company to wind down its operations. Stonewall, however, continues to thrive, mindful of the contribution quarrying activity has made to its history. When the district marked its centennial year in 1978, the commemorative stone cairn that was erected took the form of a draw kiln. More recently, local inhabitants have developed Stonewall Quarry Park, incorporating the quarries as a prominent centre-piece in an interpretive and recreational facility.

Suggestions for Further Reading

For additional information on the Stonewall Quarries and the general history of Stonewall, the reader may wish to consult the following local history books: Rockwood-Woodlands Historical Society, R.Q. Quickfall, ed. *Rockwood Echoes: 90 Years of Progress, 1870-1960* (Steinbach: Derksen Printers, 1960); R.A. Quickfall, *Re-Echoes from Rockwood: A Sequel to Rockwood Echoes* (Steinbach: Derksen Printers, 1966); Rockwood Municipality History, *100 Years of History — Rockwood Municipality* (Altona, D.W. Friesen & Sons Ltd., 1982) and Mervin E. Farmer, ed. *Stonewall: Turning a Century*, (Stonewall, Interlake Publishing Ltd., 1978).

The most enlightening source of information, however, would be a visit to Stonewall Quarry Park, in Stonewall.

Acknowledgements

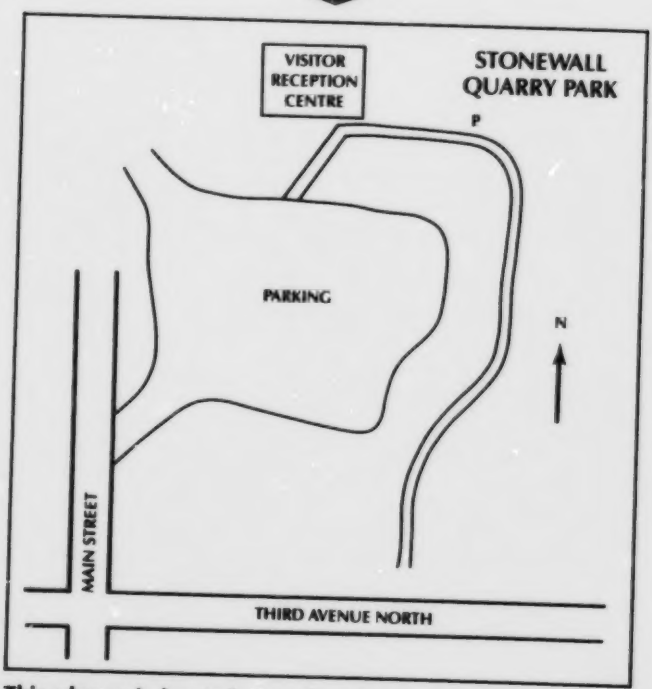
The Historic Resources Branch gratefully acknowledges the guidance provided by Messrs. Barry Bannatyne, Hugh McCabe, and Frank Pearson of Winnipeg in preparing technical portions of this pamphlet for publication. The Branch also thanks Mr. Mervin Farmer of Stonewall, publisher of the *Stonewall Argus*, for providing, identifying, and granting permission to use some of the photographs which appear above. Several of these originally appeared in Mr. Farmer's *Stonewall: Turning a Century* after having been contributed by Stonewall and district residents.

The Stonewall Quarries

Quarrying at Stonewall began ca. 1880 as part of an emerging limestone industry in southern and central Manitoba. The Stonewall quarries were noted for their continuous production of various limestone-based construction materials. The quarries were long the economic mainstay of the town.

While ordinary building stone was taken in the early years of settlement, the more significant aspect of the Stonewall trade was to be the high quality quicklime produced in the kilns by burning limestone. The whiteness of this product placed it in demand for use in plasters. Commercial quarrying ceased in 1967 with the depletion of high quality reserves of Stonewall Formation limestone.

The Historic Sites Advisory Board of Manitoba



This plaque is located near the Visitor Reception Centre at Stonewall Quarry Park, in Stonewall.